## Credits

**Quirks & Quarks Audio Clips:** Originally broadcast on CBC radio program Quirks & Quarks. Produced by the Canadian Broadcasting Corporation. Use is courtesy of the Canadian Broadcasting Corporation.

CHAPTER 1: p. 3: Science VU/GSFC/Visuals Unlimited; p. 7: CP PHOTO/ Edmonton Sun/ Walter Tychnowicz; p. 8: (t) Photodisc, (m) Corbis, (b) Photodisc; p. 9: CP/Jim Wells; p. 10: CP PHOTO/Larry MacDougal; p. 11: (wolverine) Esther Schmidt/Valan Photos, (salamander) Zig Leszczynski/Animals Animals, (whooping crane) John Cancalosi/Valan Photos, (Atlantic cod) Rick Price/CORBIS, (Fowler's toad) John Mitchell/Valan Photos, (eastern mountain avens) Nova Scotia Museum of Natural History, (pitcher's thistle) Susan Middleton & David Littscwater/CORBIS, (Kirtland's warbler) Dan Roby & K. Fri/Academy of Natural Science Philadelphia (c) Vireo; p. 12: (l) Gary Meszaros/Visuals Unlimited, (r) J.A. Wilkinson/Valan Photos; p. 15: Wayne Lankinen/Valan

**CHAPTER 2:** p. 21: © Alec Pytlowany/Masterfile; p. 33: © Roy Ooms/Masterfile; p. 34: Dr. Morley Read/Science Photo Library

CHAPTER 3: p. 41: Charles McCrae/Visuals Unlimited; p. 47: (t) 4x5/Superstock, (b) Will McIntyre/Photo Researchers; p. 52: Sir Ghillian Prance/Visuals Unlimited; p. 53: Jack Zehrt; p. 61: (t) J.D. Cunningham/ Visuals Unlimited, (m) E. Weber/Visuals Unlimited, (b) Jana R. Jirak/ Visuals Unlimited; p. 62: Sally A. Morgan/Ecoscene/CORBIS; p. 67: Dave Starrett

CHAPTER 4: p. 80: © Bill Beatty/Visuals Unlimited; p. 81: John Marriott; p. 82: (a) Gary W. Carter/Visuals Unlimited, (b) Charles Philip/Visuals Unlimited, (c) Gerald & Buff Coris/Visuals Unlimited, (d) Gerald & Buff Coris/Visuals Unlimited, (e) Bill Banaszewski/Visuals Unlimited, (f) Barbara Gerlach/Visuals Unlimited; p. 85: (tl) © R. Ian Lloyd/Masterfile, (tm ) © Sherman Hines/Masterfile, (tr) © Garry Black/Masterfile, (bl) © Miles Ertman/Masterfile, (bm) © DiMaggio/ Kalish/CORBIS, (br) © Steve Craft/Masterfile; p . 87: Courtesy of Mary Thomas. Photo by Bert Crowfoot; p. 90: (1) Maslowski/Visuals Unlimited, (r) © Werner H. Müller/CORBIS; p. 91: (l) Shutterstock (m) © Pat Anderson/Visuals Unlimited, (tr) Tom J. Ulrich/Visuals Unlimited, (mr) Shutterstock, (br) © Charles Melton/Visuals Unlimited; p. 94: (t) Harold V. Green/Valan, (b) © Christopher Morris/Corbis; p. 95 (t) Wayne Lankinen/Valan, (m) Shutterstock, (b) J.R. Page/Valan; p. 96: Joel W. Rogers/Corbis; p. 101: Richard Nowitz/Valan Photos; p. 104: John Marriott; p. 108: (l) Corel, (ml) Photodisc, (mr) Photodisc, (r) Corel; p. 109: Herman H. Guethoorn/Valan Photos; p. 115: © Bettmann/CORBIS; p. 118: Courtesy of Bill Donahue

CHAPTER 5: p. 133: (t) Auscape International Photo Library, (bottom, a) Doug Fraser, (b) Doug Fraser, (c) Christopher J. Crowel/Visuals Unlimited; p. 134: (tl) Mack Henly/Visuals Unlimited, (tm ) Hal Beral/ Visuals Unlimited, (tr) Daniel W. Gotshall/ Visuals Unlimited, (bl) Daniel W. Gotshall/ Visuals Unlimited, (bm) Gerald & Buff Corsi/ Visuals Unlimited, (br) David Fleetham/Visuals Unlimited; p. 141: (l) Michale Maslan Historic Photographs/CORBIS/MAGMA, (m) Inga Spence/Visuals Unlimited, (tr) Ken Lucas/Visuals Unlimited, (br) Ken Lucas/Visuals Unlimited; p. 142: © Carolina Biological Supply/Visuals Unlimited; p. 150 (t) Visuals Unlimited (b) Erwin Bud Nielsen/Index Stock; p. 152: © Tom Brakefield/CORBIS; p. 156: Doug Fraser; p. 157: (l) Royal BC Museum, (tr) © Raymond Gehman/CORBIS, (mr) G&R. Grambo/First Light, (br) © Ken Lucas/Visuals Unlimited; p. 161: (l) Gary Meszaros/Visuals Unlimited, (r) Ray Coleman/Visuals Unlimited; p. 163: (fig 2) Gerard Lacz/Peter Arnold, (fig 3) C. Allan Morgan/Peter Arnold, (fig 4) David Fleetham/Visuals Unlimited, (fig 5) Science VU/Visuals Unlimited, (fig 6) Shane Moore/Animals Animals, (fig 7) Still Pictures/Peter Arnold, (fig 8) David Barron / Animals Animals; p. 168: Kay Coleman/Visuals Unlimited

CHAPTER 6: p. 175: Tom Ellison/First Light; p. 177: (b) Boreal; p. 179: (t) David Nunuk/First Light; (b) NASA; p. 182: Lynne Ledbetter/Visuals Unlimited; p. 183: Gerald Van Dyke/Visuals Unlimited; p. 184: Canada Centre for Remote Sensing; p. 192: © Markowitz Jeffrey/CORBIS SYGMA; p. 196: © Canadian Museum of Civilization/CORBIS

CHAPTER 7: p. 203: © J.P. Moczulski/Reuters/Corbis; p. 214: D. Fawcett/ Visuals Unlimited; p. 222: (t) Photodisc, (b) Bettman/CORBIS; p. 223: Dick Hemingway; p. 224: AP Photo/Amy Sancetta; p. 225: UIC Photo Services, University of Illinois at Chicago

CHAPTER 8: p. 237: CP/Frank Gunn; p. 239: Meckes Ottawa/Photo Researchers, Inc.; p. 241: (tl) Jeff Greenberg/Visuals Unlimited, (tr) Malcolm S. Kirk/Peter Arnold Inc., (bl) Steve Callahan /Visuals Unlimited, (br) D.S. Kerr/Visuals Unlimited; p. 245: Thomson Nelson; p. 248: Alfred Pasieka/Science Photo Library; p. 252: U.S. Department of Energy/Photo Researchers, Inc.; p. 262: (t) Dr. R.F.R. Schiller/Science Photo Library; p. 264: Manfred Cage/Science Photo Library

CHAPTER 9: p. 281: CP/Jeff deBooy; p. 291: Lyle Stafford/Reuters /Landov; p. 294: Courtesy of Dr. Malcolm King; p. 295: (all) James Stevenson/Science Photo Library; p. 297: Canadian Cancer Society; p. 298: (l) Alfred Pasieka/Science Photo Library, (m) Prof. P.M. Motta & E. Vizza/Science Photo Library, (r) Prof. P.M. Motta & E. Vizza/Science Photo Library; p. 304: Peter Skinner / Photo Researchers, Inc.

CHAPTER 10: p. 311: (t) Cardio-Thoracic Centre/ Freeman Hospital/ Science Photo Library, (b) Z&B Barran/Stone/Getty Images; p. 312: SPL / Photo Researchers, Inc.; p. 314: (r) Cabisco/Visuals Unlimited; p. 315: (tl) Cabisco/Visuals Unlimited, (tr) Alfred Pasieka/Peter Arnold, (b) Nelson Thomson; p. 316: Ed Reschke/Peter Arnold; p. 321: Courtesy of Dr. Michael Sefton; p. 322: Cardio-Thoracic Centre/ Freeman Hospital/ Science Photo Library; p. 329: Sheila Terry/ Science Photo Library; p. 333: (l) CP/Andrew Vaughn, (r) Photodisc

CHAPTER 11: p. 349: Photodisc; p. 353: Manfred Kage/Peter Arnold; p. 357: RMF/Visuals Unlimited; p. 358: Juergen Berger/Max-Planck Institute/SPL/Photo Researchers, Inc.; p. 365: Science V.U./B.Ingelheim/Visuals Unlimited

CHAPTER 12: p. 377: Mark Oleskyn; p. 378: SIU Biomed/Custom Medical Stock Photo; p. 388: David M Phillips/Photo Researchers Inc.; p. 390: B. Nelson/Custom Medical Stock Photo; p. 391: AP Photo/PPL Therapeutics

CHAPTER 13: p. 403: © Dr. Dennis Kunkel/Visuals Unlimited; p. 407: (t) CP Photo/Kevork Djansezian, (b) City of Edmonton Archives, EA-10-2072; p. 411: CP Photo/Clifford Skarstdt; p. 430: (t) CP Photo, (b) University of Iowa; p. 431: (t) Science Photo Library/Photo Researchers, (b) Dr. M. Goedert / Photo Researchers, Inc.

CHAPTER 14: p. 445: (t) © Daryl Benson/Masterfile, (b) Janice Palmer; p. 446: © Lester Lefkowitz/CORBIS; p. 450: Ralph C. Eagle/Photo Researchers, Inc.; p. 455: Bill Kamin/Visuals Unlimited

CHAPTER 15: p. 469: CP Photo/Paul Chiasson; p. 473: C.O.R.E. Digital Pictures Inc.; p. 479: Dick Hemingway; p. 480: Banting House National Historic Site; p. 481: Courtesy of the Clinical Islet Transplant Program; p. 486: Ken Greer/Visuals Unlimited; p. 488: Biophoto Associates/Science Source/Photo Researchers, Inc.; p. 494: Bettman/CORBIS

**CHAPTER 16:** p. 507: Tracy Frankel/Image Bank/Getty Images; p. 508: (tl) Dr. Dennis Kunkel/Visuals Unlimited, (tr) Dr. Dennis Kunkel/Visuals Unlimited, (bl) Dr. Fred Hossler/Visuals Unlimited, (br) Dr. Fred

NEL Credits 853

Hossler/Visuals Unlimited; p. 509: (tl) Photodisc/Getty Images, (tm ) Corel, (tr) © H. Reinhard/zefa/Corbis, (b) Pascal Goetgheluck / Photo Researchers, Inc.; p. 511: Francois Gohier/Photo Researchers, Inc.; p. 514: G.Shih-R. Kessel/Visuals Unlimited; p. 521: David M. Phillips/ Visuals Unlimited; p. 530: (l) From Lennart Nilsson, A Child Is Born © 1966, 1977, Dell Publishing Company Inc., (m) Andy Walker, Midland Fertility Services/Science Photo Library, (r) Andy Walker, Midland Fertility Services/Science Photo Library; p. 533: (all) From Lennart Nilsson, A Child Is Born © 1966, 1977, Dell Publishing Company Inc.; p. 536: Courtesy of Dr. Keith Bagnall; p. 538: Oxford Scientific Films

CHAPTER 17: p. 553: © Dr. Gopal Murti/Visuals Unlimited; p. 555: (tl) K. Calentine/ Visuals Unlimited, (tr) Visuals Unlimited, (bl) David M. Phillips/Visuals Unlimited, (br) David M. Phillips/Visuals Unlimited; p. 557: John D. Cunningham/Visuals Unlimited; p. 560: Ed Reschke/ Peter Arnold; p. 561 (all) Ed Reschke/ Peter Arnold; p. 565: (l) J.A.L. Cooke/ Oxford Scientific Films, (ml) Kevin & Betty Collins/Visuals Unlimited, (mr) Mark E. Gibson/Visuals Unlimited, (r) Andre Gallant/ The Image Bank/Getty Images; p. 567: Science VU /Visuals Unlimited; p. 568: AP/Paul Clements; p. 575: A. Morris/ Visuals Unlimited; p. 582: Courtesy of Dr. Renee Martin; p. 583: (t) CP/Don Janisse, (b) CP/Frank Gunn; p. 584: (l) Scott Camazine/Oxford Scientific Films, (r) Valerie Lindgren/ Visuals Unlimited; p. 589: © Biodisc/Visuals Unlimited

CHAPTER 18: p. 597: (tl) CP/Ryan Remiorz, (tr) Doug MacLellan/Hockey Hall of Fame, (bl) CP/Shaney Komulainen; (br) Kurt Kreiger/CORBIS; p. 598: CORBIS; p. 608: Dr. Jeremy Burgess/Science Photo Library; p. 609: E.R. Degginger; p. 615: (all) Richard Siemens; p. 618: Photos.com; p. 620: Carolina Biological Supply Co.

CHAPTER 19: p. 627: © John McAnulty/CORBIS; p. 628: Royal Windsor Library; p. 629: Dr. D.R. Degginger; p. 633: Custom Medical Stock; p. 641: B. Ritter; p. 642: Getty Images; p. 646: (t) © Bettmann/CORBIS, (m) Courtesy of the National Library of Medicine, (b) Oliver Meckes/ E.O.S./MPI-Tubingen/Photo Researchers, Inc.; p. 648: Barrigton Brown/ Photo Researchers, Inc.; p. 649: Omikron/Photo Researchers, Inc.; p. 650: Bromide print by Vittoro Luzzati/National Portrait Gallery, London

**CHAPTER 20:** p. 661: Nelson Thomson; p. 668: 2313 R.C. Williams, Proc. Nat. Academy of Science 74 (1977); p. 678: Courtesy of Dr. Judith Hall

CHAPTER 21: p. 711: © Gunter Marx Photography/CORBIS; p. 713: Gary Meszaros/Visuals Unlimited; p. 714: (l) © Hal Beral/Visuals Unlimited, (r) Photos.com; p. 715: Will & Deni McIntyre/Photo Researchers, Inc.; p. 716: Merlin Tuttle/Bat Conservation International; p. 723: © John Cornell/Visuals Unlimited; p. 724: © Joe McDonald/Visuals Unlimited; p. 728: © Joe McDonald/Visuals Unlimited; p. 729: © Gerald & Buff Coris/Visuals Unlimited

CHAPTER 22: p. 737: (t) A.B.P.L./Photo Researchers, Inc., (b) © Roger Garwood & Trish Ainslie/CORBIS; p. 738: Arthur Morris/Visuals Unlimited; p. 739: (t) Gary Meszaros/Visuals Unlimited, (b) Courtesy of Dr. Stephen Herrero; p. 740: (l) Frederick R. McConnaughey/Photo Researchers, Inc., (m) Fritz Polking/Visuals Unlimited, (r) Will & Deni McIntyre/Photo Researchers, Inc.; p. 742: (l) Janice Palmer, (r) Janice Palmer; p. 749: Arthur Morris/Visuals Unlimited; p. 750: Feltcher & Baylis/Photo Researchers, Inc.; p. 751: Gary Meszaros/Visuals Unlimited; p. 752: (t) Ken Lucas/Visuals Unlimited, (b) John Gerlach/Visuals Unlimited; p. 753: (l) Palmer SciEd Services, (r) Palmer SciEd Services; p. 755: (l) Alison Barnes Martin/Masterfile, (r) © Greg Dimijian/Photo Researchers, Inc.; p. 757: (l) Doug Fraser, (m) © Jim Hughes/Visuals Unlimited, (r) Shutterstock

CHAPTER 23: p. 763: (a) © Jacques Langevin/CORBIS SYGMA, (b) Bill Kamin/Visuals Unlimited, (c) B&C Alexander/First Light; p. 764: Mitch Reardon/Photo Researchers, Inc.; p. 767: Joe McDonald/Visuals Unlimited; p. 768: (tl) Bill Beatty/Visuals Unlimited, (bl) Gary Meszaros/Visuals Unlimited, (m) Lincoln P. Brower, Sweet Briar College, (r) Lincoln P. Brower, Sweet Briar College; p. 769: Stephen J. Kraserman/Photo Researchers; p. 770: D.M. Caron BES/Visuals Unlimited; p. 771: Larry Miller/Photo Researchers, Inc.; p. 772: Barbara Von Hoffman/Tom Stack & Associates; p. 780: top (a) Cheryl A. Ertelt/Visuals Unlimited, (b − top) William J. Weber/Visuals Unlimited, (b − bottom) Joe McDonald/Visuals Unlimited, (c) S. Camazine/P.K.Visschers/Photo Researchers, Inc., (d) Doug Fraser; (bl) John Gerlach/Visuals Unlimited, (br) John Gerlach/Visuals Unlimited; p. 784: Doug Fraser

854 Credits NEL